

CLAIMS:

1. A process of forming a magnetic assembly having at least one magnetic layer having dimensions of thickness, width and length, and at least one printable substrate layer having dimensions of thickness, width and length, comprising the steps of:
  - a) providing a molten magnetic composition comprising about 70 wt-% to about 95 wt-% of at least one magnetic material and about 5 wt-% to about 30 wt-% of at least one thermoplastic binder;
  - b) forming said magnetic composition into said magnetic layer at an elevated temperature; and
  - c) directly applying said magnetic layer at an elevated temperature when it is pliable to a printable substrate layer.
- 15 2. The process of Claim 1 wherein said applying step b) affixes said magnetic layer to said printable substrate layer in dimensions of thickness and width in final form.
3. The process of Claim 1 wherein said applying step b) affixes said magnetic layer to said printable substrate layer in dimensions of thickness, width and length in final form.
- 20 4. The process of Claim 1 further comprising subjecting said magnetic assembly to a strong magnetic field sufficient to result in a permanent magnetic effect in the assembly.
- 25 5. The process of Claim 4 wherein the magnetic composition is at an elevated temperature while subjecting said magnetic assembly to said magnetic field.
- 30 6. The process of Claim 4 wherein said magnetic composition has cooled to ambient temperature.

7. The process of Claim 4 wherein said magnetizing step is accomplished after said applying step during said forming process.
8. The process of Claim 1 further comprising the step of printing said printable substrate.
9. The process of Claim 1 wherein said magnetic assembly is formed in a roll form on a web.
10. The process of Claim 1 wherein said magnetic assembly is formed in sheet form.
11. A process for forming a pad article comprising forming a plurality of magnetic sheet assemblies by the process of Claim 1 and layering the sheet assemblies together to form a stacked pad.
12. The process of Claim 11 wherein said plurality are bound together with an adhesive or shrink wrapped.
13. The process of Claim 1 wherein said temperature of application is from about 135 °C to about 190 °C.
14. The process of Claim 1 wherein said forming step includes a step selected from roll coating, gravure coating, screen printing and slot-die coating.
15. The process of Claim 1 wherein said forming step includes extruding.
16. The process of Claim 1 wherein said magnetic material has the following general formula:
- $$M^{2+}O_6Fe_2O_3$$
- wherein M represents a divalent metal.

17. The process of Claim 16 wherein said divalent metal is barium, strontium, lead or mixture thereof.
18. The process of Claim 1 wherein the thermoplastic binder comprises at least one member selected from the group consisting of natural rubbers, block copolymers, polyolefins, polyalphaolefins, polyesters, polyamides, nylons, polyurethanes, copolymers thereof, and mixtures thereof.
19. The process of Claim 1 wherein the thermoplastic binder comprises at least one polyalphaolefin.
20. The process of Claim 19 wherein said at least one polyalphaolefin is an amorphous polypropylene or an interpolymer of ethylene and at least one alphaolefin.
21. The process of Claim 1 wherein said magnetic material has a particle size of about 40 microns or less.
22. The process of Claim 1 wherein said at least one magnetic layer has a thickness of about 50  $\mu$  to about 765  $\mu$ .
23. The process of Claim 1 wherein said at least one magnetic layer has a thickness of about 50  $\mu$  to about 510  $\mu$ .
24. The process of Claim 1 wherein said at least one magnetic layer has a thickness of about 50  $\mu$  to about 305  $\mu$ .
25. The process of Claim 1 wherein said magnetic composition is applied to said printable substrate in the form of at least one ribbon.
26. The process of Claim 25 further comprising the step of pressing said at least one

ribbon to said printable substrate.

27. The process of Claim 25 wherein said at least one ribbon is pressed to said substrate with a chill roll.

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28. The process of Claim 25 wherein said at least one ribbon has substantially the same length and width as said printable substrate.

29. The process of Claim 26 wherein said at least one ribbon is discontinuous with  
10 said printable substrate.

30. The process of Claim 1 wherein said printable layer comprises paper, metal,  
fabric, or plastic.

- 15 31. The process of Claim 1 wherein said printable layer is further treated with a  
varnish, lacquer, film or mixture thereof.

32. The process of Claim 1 wherein said magnetic layer is further joined to a release  
liner.

- 20 33. The process of Claim 32 wherein said release liner is adhered to an article  
through the use of an adhesive.

34. The process of Claim 33 wherein said article is a magazine, book, food package,  
25 beverage container, envelope or box.

35. The process of Claim 32 further comprising the step of removing said magnetic  
assembly from said release liner.

- 30 36. The process of Claim 32 wherein said magnetic assembly further has an  
overlaminate over said printable substrate layer.

37. The process of Claim 32 wherein said overlaminates is perforated in substantially the same dimensions as said magnetic assembly.

5 38. The process of Claim 1 wherein said magnetic substrate is a reminder, business card, greeting card, postcard, label, advertisement, coupon, calendar, schedule, recipe or promotional card.

10 39. The process of Claim 1 wherein said magnetic layer is continuous with said printable layer.

40. The process of Claim 1 wherein said magnetic layer is applied to said printable layer in a discontinuous pattern.

15 41. The process of Claim 1 wherein said magnetic layer and said printable layer are of equivalent length and width.

20 42. An article which is capable of adhering to a magnetic surface having at least one printable substrate layer and at least one magnetic layer made by the process of Claim 1.

43. A process of forming a magnetic assembly having at least one magnetic layer and at least one printable substrate layer comprising the steps of:

- a) providing a magnetic composition in molten form, the composition comprising about 70 wt-% to about 95 wt-% of at least one magnetic material and about 5 wt-% to about 30 wt-% of at least one thermoplastic binder; and
- b) forming said magnetic composition into a magnetic layer; and
- b) directly applying said magnetic layer at an elevated temperature when it is pliable to a printable substrate;

25 30 wherein adequate adhesion is obtained between said magnetic layer and said printable substage layer.

44. An article which is capable of adhering to a magnetic surface having at least one printable substrate layer and at least one magnetic layer made by the process of Claim 43.
- 5 45. An article which is capable of self-adhering to a magnetic metal surface comprising:
- a) a first magnetic layer comprising from about 5 wt-% to about 30 wt-% of at least one polyalphaolefin binder and about 70 wt-% to about 95 wt-% of at least one magnetic material having the following general structure:
- 10 b) a second layer of a printable material;  
wherein said first layer and said second layer are adhered together without the use of an additional adhesive layer.
46. The article of Claim 45 wherein said article is a reminder, a greeting card, postcard, coupon, label, business card, advertisement, calendar, recipe, schedule, or promotional card.
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47. The article of Claim 45 wherein said printable material is paper, plastic or metal.
- 20 48. The article of Claim 45 wherein said first layer has a thickness of about 50  $\mu$  to about 765  $\mu$ .
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49. The article of Claim 45 wherein said polyalphaolefin is an amorphous polypropylene or copolymer thereof, or an interpolymer or ethylene and at least one alphaolefin.
50. An article which is capable of self-adhering to a metal surface comprising:
- a) a first magnetic layer which is about 50  $\mu$  to about 765  $\mu$  thick comprising from about 5 wt-% to about 30 wt-% of at least one thermoplastic binder and about 70 wt-% to about 95 wt-% of at least one magnetic material;
- 30 and

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- b) a second layer of a printable material;  
wherein said first layer and said second layer are adhered together without the use  
of an additional adhesive layer.
- 5 51. The article of Claim 50 wherein said thermoplastic binder comprises at least one  
selected from the group consisting of natural rubbers, block copolymers,  
polyolefins, polyalphaolefins, polyesters, polyamides, nylons, polyurethanes,  
copolymers thereof, or mixtures thereof.
- 10 52. The article of Claim 50 wherein said magnetic material comprises at least one  
compound having the formula  $M^{2+}O_6Fe_2O_3$  wherein M represents a divalent  
metal.
- 15 53. The article of Claim 52 wherein said divalent metal is barium, strontium, lead or  
mixture thereof.
54. The article of Claim 50 wherein said first magnetic layer is about 50  $\mu$  to about  
510  $\mu$  thick.
- 20 55. The article of Claim 50 wherein said first magnetic layer is about 50  $\mu$  to about  
305  $\mu$ .
56. A magnetic composition comprising:  
a) comprising about 5 wt-% to about 30 wt-% of at least one polyalphaolefin  
25 binder; and  
b) about 70 wt-% to about 95 wt-% of at least one magnetic material.
57. The composition of Claim 56 wherein said polyalphaolefin is an amorphous  
polypropylene or a copolymer or terpolymer thereof; an interpolymer of ethylene  
30 and at least one alphaolefin; or mixture thereof.

58. The composition of Claim 57 wherein said magnetic material has the following general structure:



wherein M represents a divalent metal.

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59. The composition of Claim 58 wherein said divalent metal is barium, strontium, lead, or mixture thereof.

60. A process of forming a magnetic assembly having at least one magnetic layer

10 having dimensions of thickness, width and length, and at least one printable substrate layer having dimensions of thickness, width and length, comprising the step of extruding in final form at an elevated temperature a magnetic composition comprising about 70 wt-% to about 95 wt-% of at least one magnetic material and about 5 wt-% to about 30 wt-% of at least one thermoplastic binder onto a

15 printable substrate layer.

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